

WHAT IS CLAIMED IS:

1. A water-based ink comprising:
- (C) a coloring material; and
- (D) an aqueous dispersion of polymer particles comprising a water-insoluble graft copolymer having an acrylic polymer side chain (P) and a salt-forming group (Q), wherein the acrylic polymer side chain (P) comprises a polymer made of at least one monomer represented by the formula (1):



wherein R¹ is hydrogen atom or an alkyl group having 1 to 5 carbon atoms; and R² is an alkyl group having 1 to 20 carbon atoms.

2. The water-based ink according to claim 1, wherein the graft copolymer is a vinyl polymer obtained by copolymerizing
- (i) a (meth)acrylic macromer (a) having a polymerizable functional group at one end;
 - (ii) a polymerizable unsaturated monomer (b) having a salt-forming group; and
 - (iii) a monomer (c) copolymerizable with the (meth)acrylic macromer (a) and the polymerizable unsaturated monomer (b).

3. The water-based ink according to claim 2, wherein at least a part of the monomer (c) is a monomer represented by the formula (2):



wherein R¹ is as defined above; R³ is a divalent hydrocarbon group having 1 to

30 carbon atoms, which may have a heteroatom; R^4 is hydrogen atom or a monovalent hydrocarbon group having 1 to 30 carbon atoms, which may have a heteroatom; and n is a number of 1 to 60.

4. The water-based ink according to any one of claims 1 to 3, wherein the graft copolymer has a nonionic polymer side chain (R) comprising a polymer made of at least one monomer represented by the formula (2):



wherein R^1 , R^3 and R^4 are as defined above; and n is a number of 1 to 60; a polymer made of at least one monomer represented by the formula (3):



wherein R^1 is as defined above; and each of R^5 and R^6 is independently hydrogen atom or an alkyl group having 1 to 5 carbon atoms, or a copolymer made of at least one monomer represented by the formula (2) and at least one monomer represented by the formula (3); or is a group represented by the formula (4):



wherein R^3 and R^4 are as defined above; and m is a number of 3 to 60.

5. The water-based ink according to claim 4, wherein the graft copolymer is a polymer prepared by the polymerization of a polymer (S) having an initiator structure showing a function as an initiator for polymerization or addition reaction with a monomer (m) for initiating a polymerization or an addition reaction by the polymer (S), or by the addition reaction of the monomer (m) to the polymer (S).

6. The water-based ink according to claim 5, wherein the polymer (S) is a polymer having an initiator structure prepared by converting to an initiator structure an initiator precursor structure of a polymer (T) having an initiator precursor structure which is convertible to an initiator structure by the reaction, and the polymer (T) is a homopolymer made of a monomer (n) having an initiator precursor structure, or a copolymer of the monomer (n) with a monomer (o) copolymerizable with the monomer (n).

7. The water-based ink according to claim 4, wherein the graft copolymer is a polymer prepared by reacting a reactive group (h) of a polymer which forms a main chain with a reactive group (i) of a polymer which forms a side chain, said reactive group (i) being positioned at the terminal of the polymer and having a reactivity with the reactive group (h).

8. The water-based ink according to claim 1, wherein the polymer particles comprise at least one agent selected from the group consisting of ultraviolet ray absorbents, photostabilizers, antioxidants and ozone-deterioration preventives.

9. The water-based ink according to claim 1, wherein the graft copolymer has a functional group showing at least one property selected from the group consisting of ultraviolet ray absorptivity, photostabilization, antioxidation and ozone-deterioration prevention.